2.1 ALTERNATIVE DEVELOPMENT AND EVALUATION METHODOLOGY

2.1.1 Overview

A range of alternatives was developed for the US 8 corridor that reflects the goal of the study to identify a preferred corridor for 40 miles (64.4 km) that could then be preserved until the proposed long-range improvements are warranted. The alternatives were developed through an agency scoping and public involvement process to seek consensus on where expansion and/or relocation of the corridor should occur in the future. Each alternative was then evaluated for its ability to meet the project's purpose and need. The Council on Environmental Quality (CEQ), which coordinates federal environmental efforts and the development of environmental policies and initiatives, requires that alternatives considered in an EIS be deemed feasible and prudent before they are moved forward for further study. The evaluation process used for the US 8 alternatives helped to determine whether the alternatives could be considered feasible and prudent. The alternatives that did not pass the evaluation process were dismissed. All of the alternatives considered are discussed in Section 2.2.

2.1.2 Alternative Development Process

2.1.2.1 Agency Coordination

Requests for safety improvements and a potential capacity expansion to a future four-lane highway were initiated by the US 8 Coalition and brought to state legislators who enumerated funds for a US 8 corridor study in 2001. WisDOT held a kick-off meeting and two scoping meetings with agencies and local officials (in September 2002 and September 2003). The meetings were used to relate results of a needs assessment and then develop preliminary alternatives based on agency input and concerns identified. Agency coordination included federal, state and local agencies and Native American tribes. Agencies that expressed interest or concerns with the project included: U. S. Department of Interior (DOI) Fish and Wildllife Service (FWS); DOI National Park Service (NPS); U.S. Environmental Protection Agency (EPA); U.S. Corps of Engineers (COE); Wisconsin Department of Natural Resources (WDNR); Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP); State Historical Society of Wisconsin (SHSW). Local agencies included the US 8 Coalition, Polk and Barron Counties, City of Barron, Villages of Turtle Lake and Almena, Towns of Beaver, Almena, Apple River, St. Croix Falls, Balsam Lake, and Clinton. Native American tribes expressing an interest or concerns with the project included Prairie Band Potawatomi Nation Government Center, Forest County Potawatomi Community of Wisconsin, Lac du Flambeau Band of Lake Superior Chippewa, Menominee Indian Tribe of Wisconsin, Iowa Tribe of Oklahoma and Sac & Fox Nation of Missouri in Kansas & Nebraska.

In August 2003, FHWA invoked the Federal NEPA/404 Interagency Merger Agreement with federal agencies COE, EPA and FWS. The interagency agreement provides a process to obtain concurrence on three key components of an EIS: purpose and need, range of alternatives, and the preferred alternative. Two separate reviews were requested of these cooperating agencies for US 8 EIS because COE and EPA voiced concerns with aspects of the first draft of the purpose and need. The decision to use a tiered approach to the project required a separate revision of the purpose and need and evaluation of alternatives in 2005.

In November 2003, several state agencies participated in a Value Engineering study of the corridor alternatives (see Section 2.4 Value Engineering Study). A number of refinements were made to some of the alternatives as a result.

2.1.2.2 Public Involvement

The study team interacted with area residents and businesses, local officials and the general public using a variety of information exchange forums including a transportation needs survey and focus group meetings. Vision workshops were held in Barron and Turtle Lake early in the alternative development process to utilize local knowledge in locating conceptual bypass corridor locations. A series of public information meetings garnered substantial feedback from property owners and the general public regarding transportation needs for US 8 and comments on conceptual and refined alternatives. The first public meeting in April 2002 introduced the study and the needs assessment. The second public meeting

in February 2003 presented conceptual alternatives. Comments were primarily concerned about potential losses of property, business and farmland resulting from the effects of bypasses on communities, and environmental impacts associated with bypass alternatives. In June 2003, the study team held public meetings in Turtle Lake and Barron to present details of the through-town alternatives, and refinements to on-alignment alternatives. The bypass alternatives were also reviewed. In October 2003, the fifth public information meeting was held in Balsam Lake and focused on the alternative refinements and impacts in the Deer Lake area. In addition to public meetings, newsletters, Web site updates, local office hours, toll-free calling, and face-to-face and business group meetings were used to exchange information and gather comment.

2.1.2.3 Alternative Development Methodology

A study goal is to reach consensus on the location of a 40-mile (64 km) corridor that would allow future roadway improvements within the corridor to meet anticipated safety, capacity, and level of service (LOS) needs. Alternative corridors required that conceptual design parameters and standards be established to meet those needs.

The Four-lane Alternatives are further categorized as on-alignment, realignment, bypass, or through-town alternatives based on the predominant location of the proposed US 8 corridor within a particular segment. Key features include:

- On-alignment corridor alternatives utilize the current US 8 roadway for one direction of travel and provide an additional two lane roadway for the opposing direction of travel. On-alignment corridors are 400 feet (121.9 m) wide.

- Realignment corridor alternatives were developed to relocate US 8 around a small community or particular feature and potentially provide local road access via at-grade intersections. Realignment corridors are 400 feet (121.9 m) wide.

- Bypass corridor alternatives were developed to relocate US 8 around the Village of Turtle Lake and the City of Barron. Bypass corridors would provide access only at interchanges. Bypass corridors are 600 feet (182.9 m) wide. A future bypass corridor alternative could utilize an interim improvement where wo lanes could be constructed on a four-lane facility right-of-way. As traffic increases, and capacity expansion is warranted, additional lanes could be added.

- A 70 miles per hour (mph) (112.7 km/hr) design standard is used for the three rural corridor types as required by WisDOT's Facilities Development Manual (FDM). The FDM standards also designate the typical rural cross section with 12-foot (3.7 m) lanes, a 60-foot (18.3 m) median, 6-foot (1.8 m) inside shoulders, and 10-foot (3.0 m) outside shoulders. Figures 2.1.2.3-1 and 2.1.2.3-2 show this cross section located within the 400-foot (121.9 m) and 600-foot (182.9 m) study corridors.

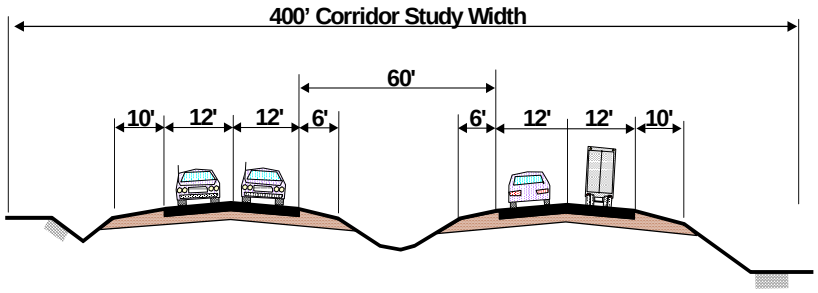

Figure 2.1.2.3-1 Proposed Cross Section within a 400-Foot (121.9 m) Study Corridor

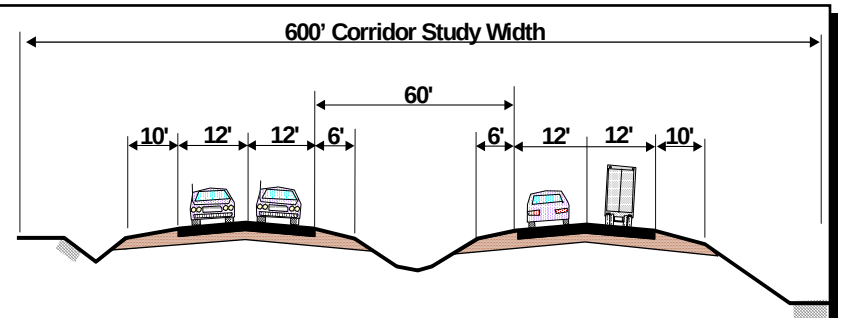

Figure 2.1.2.3-2 Proposed Bypass Cross Section within a 600-Foot (182.9 m) Study Corridor

- Through-town corridor alternatives are urban through Turtle Lake and Barron with corridor widths of 120 feet (36.6 m) and 100 feet (30.5 m), respectively. In Turtle Lake, the posted speed limit would be 45 mph (72.4 km/hr). The Turtle Lake through-town cross section includes curb and gutter, a 30-foot (9.1 m) raised median to accommodate left turns, 12-foot (3.7 m) lanes, 10-foot (3.0 m) buffer area, 5-foot (1.5 m) terrace, and 5-foot (1.5 m) sidewalk. The 12-foot (3.7 m) lanes are used because US 8 is classified as a long truck route. Figure 2.1.2.3-3 shows the proposed Turtle Lake cross section.

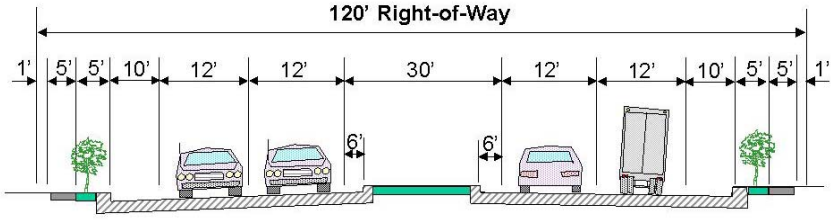

Figure 2.1.2.3-3 Proposed Cross Section Through Turtle Lake

- In Barron, the cross section is narrower than Turtle Lake to reduce impacts to buildings close to the existing roadway. With a narrower cross section and less shoulder width, the posted speed limit through Barron would be 35 mph (56.3 km/hr). The Barron through-town cross section includes curb and gutter, a 22-foot (6.7 m) raised median to accommodate left turns, inside lanes of 11-feet (3.4 m) and outside lanes of 12-feet (3.7 m). A 6-foot (1.8 m) buffer area, 5-foot (1.5 m) terrace, and 5-foot (1.5 m) sidewalk completes this cross section as shown in Figure 2.1.2.3-4.

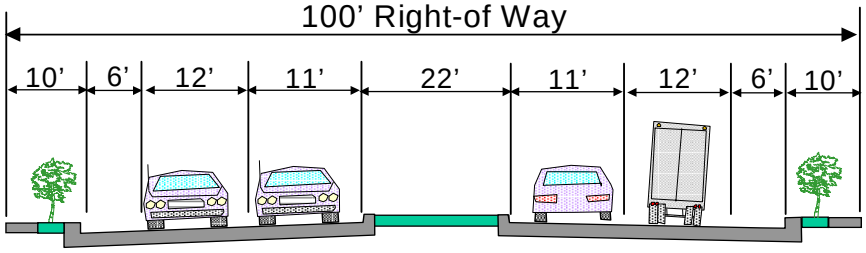

Figure 2.1.2.3-4 Proposed Cross section Through Barron

The 400-foot (121.9 m) and 600-foot (182.9 m) corridors of the Four-lane Alternatives reflect the planning nature of this study and not the actual right-of-way needed. These corridor widths provide flexibility to accommodate possible shifts of the preliminary roadway alignment developed as part of this Tier 1 EIS during future, detailed design efforts.

US 8 travels through a mix of rural and populated environments, and avoidance of impacts helped direct the development of corridor alternatives. An aerial photo base map showing existing roads, environmental and other geographic features of interest was developed. The map showed information such as wetland areas, rivers, streams and lakes; woodlands; property lines from the 1998 Polk and Barron county plat books that were superimposed on the mapping; corporate boundaries; roadway names and boundaries; parks; cemeteries; treatment plants; industrial lands and potentially historic properties. The map was used by the study team and the public to identify potential corridor locations that would avoid or minimize the impacts to important resources.

The 40-mile (64.4 km) corridor was divided into seven segments for analysis of the four-lane corridor alternatives. These segments are different than those used to describe the existing highway's characteristics, crash statistics or traffic analysis. Six of the seven segments contain multiple alternatives, for example an on-alignment and two realignment alternatives. Some segments contain both 400-foot (121.9 m) corridor widths and 600-foot (182.9 m) corridor widths (Barron and Turtle Lake bypass sections). Each of the four-lane alternatives is carried forward in the study process, and each has a component of corridor preservation. In four of the seven segments, the four-lane alternatives could include the addition of passing lanes as an interim improvement. Table 2.1.2.3-1 illustrates the US 8 project alternatives.

Table 2.1.2.3-1

US 8 Project Alternatives

	Transportation Demand Management **No-build Alternative** **Passing Lane Alternative** **Four-lane Alternatives:**	
Segment	**Segment Limits**	**Segment Alternatives**
I	**200th Street to 120th Street**	Deer Lake On-alignment Deer Lake Southern Realignment Deer Lake Far Southern Realignment
II	**120th Street to County E**	Apple River/Clover Lake On-alignment
III	**County E to 50th Street**	Range On-alignment Range Northern Realignment Range Southern Realignment
IV	**50th Street to 15th Street**	Joel Flowage On-alignment Joel Flowage Northern Realignment
V	**15th Street to 5th Street**	Turtle Lake Alternative 1 (Short South Bypass) Turtle Lake Alternative 2 (Long South Bypass) Turtle Lake Alternative 3 (Northern Bypass) Turtle Lake Alternative 4 (Through-town)
VI	**5th Street to Sweeny Pond Creek**	Poskin On-alignment Poskin Southern Realignment
VII	**Sweeny Pond Creek to US 53**	Barron Alternative A (Short South Bypass) Barron Alternative B (Long South Bypass) Barron Alternative C (North Bypass) Barron Alternative D (Through-town)

2.1.3 Evaluation Process and Methodology

The evaluation process for the alternatives developed considers the projected effects of the alternative and addresses if the alternative meets the purpose and need.

The discussion for each of the alternatives in Section 2.2 is divided into three parts. The first part describes the alternative, the second part discusses a projected effects analysis of the alternative, and the third part discusses whether the purpose and need criteria is met.

2.1.3.1 Projected Effects Analysis

The Projected Effects Analysis will present some of the direct environmental impacts or consequences associated with each alternative and how the impacts affect the feasibility of the alternatives. Direct, indirect, and cumulative impacts are discussed in the document. Direct impacts are ones that are directly affected by the proposed alternative and include land acquisitions and residential and business relocations. Direct impacts were measured for each of the corridor alternatives. Indirect impacts are environmental effects to land uses that are indirectly affected by the proposed alternative. Indirect impacts examples include business and commercial development near an interchange of a proposed alternative. Indirect impacts are not the direct result of the alternatives, but transportation improvements, combined with other factors, may provide the opportunity for these changes.

Primary land acquisitions involving wetlands or agricultural lands and potential residential and business relocations were estimated. Also, the impacts to natural resources such as rivers and streams, parklands, state lands, and historical and archaeological sites have been estimated. Direct impacts for each segment were calculated to ensure that estimates for each alternative remained comparable. Impacts were calculated based on 400-foot (121.9 m) corridors for on-alignment or realignment areas, and 600-foot (182.9 m) corridors for the Village of Turtle Lake and City of Barron bypass alternatives. Direct impacts were measured in the Village of Turtle Lake and City of Barron through-town alternatives using a 120-foot (36.6 m) and 100-foot (30.5 m) corridor, respectively.

The methods used to calculate the various direct impacts on alternatives include:

- Agricultural land and woodlands – Impacts calculated based on aerial mapping of the corridor.
- Wetlands – Impacts identified from the Wisconsin Department of Natural Resources (WDNR) Geographic Information System (GIS) mapping.
- Threatened and Endangered Species – Impacts identified based on a WDNR Bureau of Endangered Resources record review (detailed in Section 4.0).
- Relocations – Impacts calculated using aerial mapping and field reviews. The total number of residential and commercial relocations was based on the 400-foot (121.9 m) and 600-foot (182.9 m) proposed corridors. The number of relocations during final design may be less than what is shown.
- Historical Resources – Impacts identified from archive and literature searches, field review, and completed Determination of Eligibility (DOEs) on specific architectural sites.
- Archaeological Sites – Impacts based on an archive and literature search and field reviews to verify previously identified sites, identify new sites, and determine eligibility in the National Register of Historic Places (NRHP).
- Hazardous Materials – Impacts identified based on a Phase I Reconnaissance identifying potential contaminated sites (detailed in Section 4.0).
- Dairyland Power Cooperative Utilities – The majority of Dairyland Power Cooperative Utilities are 69 kilovolts (kv) and relocation costs are substantial. Impacts/costs to utilities outside the existing right-of-way were identified and costs are based on information provided by the utility. Costs required for relocation of utility poles ranges between $175,000 and $250,000 per mile. However, there is one power line along the project corridor that is 161 kv and the cost to relocate these poles is about $400,000 to $500,000 per mile. Costs are provided on a per mile basis because the cost of relocating and moving one utility pole typically requires moving one or two additional poles on either side.

The Projected Effects Analysis briefly discusses some key direct impacts. The impacts discussed are located outside of the existing right-of-way but inside of the proposed 400-foot (121.9 m) or 600-foot (182.9 m) corridor. More detailed direct impacts are discussed in Section 4.0. Wetland impacts discussed in Section 4.0 include all impacts to wetlands inside the existing right-of-way as well as wetlands in the project corridor. A detailed indirect and cumulative impact analysis is provided in Section 4.3.

2.1.3.2 Project Purpose and Need Analysis Criteria

The project purpose and need defines the criteria that all the alternatives will be measured against. As part of the study process, only alternatives that satisfy the project purpose and need will be carried on for further study; alternatives that do not satisfy the criteria are dismissed. The criteria the alternatives must address are:

- Addressing Corridors 2020 Plan (Route Importance) and Future LOS
- Addressing Long-term Planning and Corridor Preservation
- Reducing Crash Rates in Urban Areas
- Correcting Substandard Roadway Items
- Addressing Legislative Mandate and Public Response

- **Addressing Corridors 2020 Plan and Future LOS**

The first and third components of the project need, as listed in Section 1.1.2, must be addressed simultaneously in the analysis. Providing a facility that meets the Corridors 2020 Plan by providing future corridor capacity and appropriate level of service are criteria that tie the expected function of the roadway to its operation. As a Connector Route in WisDOT's Corridors 2020 plan, US 8 links economic and tourism areas to the "backbone system," integrating them into the statewide and regional transportation systems. An alternative satisfies this criterion if US 8 can function as a connector route with acceptable LOS.

According to WisDOT's FDM, in rural and small urban areas (population $\leq$ 50,000), Corridors 2020 connector routes should have an LOS C or better in the design year. These thresholds are applied to the Corridors 2020 "in recognition of its importance from a mobility and economic development perspective."[1] Typically, WisDOT considers capacity improvements when the design year ADT of a two-lane rural 2020 Connector Route reaches about 8,700 ADT. Currently, the US 8 corridor has traffic volumes that are close to exceeding this design year traffic volume. WisDOT policy permits this capacity improvement threshold to be raised to about 12,000 ADT if passing lanes are found to be adequate for the facility and a reduced LOS is acceptable. In the design year 2030, projected traffic volumes in the western portion of rural areas exceed this higher threshold of 12,000 ADT by about 15 percent. Between 2002 and 2003, WisDOT added passing lanes in some of the two-lane rural segments. This provides short-term relief by providing increased passing opportunities. In the design year of 2030, the ability for traffic on side roads to cross or turn onto US 8 in both the rural and urban areas will be increasingly difficult.

- **Addressing Long-term Planning and Corridor Preservation**

Wisconsin state statutes require that every city, village, county, and town have a comprehensive plan in place by the year 2010. Long-term transportation planning and corridor preservation are important components of comprehensive plans and long-term land use planning must consider maintaining mobility through and around the growing communities. State statutes also require local plans to consider state planning efforts when developing the local plan.

Alternatives should be developed to accommodate future growth and development in the communities along the corridor while also providing for a long-term corridor preservation focus. Input from local governments is vital for developing transportation alternatives in accordance with plans for land development and expected growth. Following this planning, steps need to be taken to preserve the corridor selected.

The four methods that can be used to preserve the US 8 corridor are:

- Wisconsin State Statutes (Wis. Stat. 84.295) – Expressway/Freeway Designation and Mapping Tool
- Final Environmental Impact Statement Right-of-Way Purchase
- Locally Adopted Official Map
- County Adopted Official Map

- **Reduce Crash Rates in Urban Areas**

Crash rates are an indicator of highway safety. Crash rates are often used to compare the safety of highways and other types of transportation modes. In order to calculate average yearly crash rates, the total number of crashes for a particular roadway segment is multiplied by 100,000,000 and is divided by

[1] Wisconsin Department of Transportation Facilities Development Manual, Procedure 11-5-3.

the ADT and length of that segment. The typical crash rate measurement is crashes per 100 million vehicle miles (HMVM).

The crash history for the US 8 corridor was analyzed for the five-year period between 1996 and 2000. Within the Village of Turtle Lake, two of the five years had crash rates higher than the statewide urban average. Similarly, within the City of Barron, four of the five years had rates higher than the statewide urban average. Within the same five-year period, there were five crashes involving pedestrians in Barron. Many of the crashes within these two communities can be attributed to side-street drivers taking risks when there are insufficient gaps in US 8 traffic and lack of turn lanes on US 8.

Increasing traffic volumes without corridor improvements are likely to increase crash rates. To accurately compare alternatives, this safety criterion is applied qualitatively and quantitatively to each section of the corridor. To satisfy this criterion, bypasses should reduce the combined crash rate of both the new bypass roadway and the existing US 8 roadway.

- **Correcting Substandard Roadway Items**

Currently, the US 8 corridor has substandard roadway items that are geometric-related including horizontal curves that exceed the maximum allowable superelevation, poor visibility at intersections, areas that do not have adequate Stopping Sight Distance (SSD) on vertical curves, and substandard shoulder widths. About 45 percent of the corridor has access control measures in place. The frequency of access points and the close spacing in most areas does not meet FDM guidelines. The alternative should meet the minimum design standards according to WisDOT's FDM and provide an appropriate approach to control of access.

- **Addressing Legislative Mandate and Public Response**

In 1994, county and local officials formed the US 8 Coalition to discuss safety concerns and congestion problems along the corridor. They communicated these concerns to WisDOT and the state legislature. As a result, the US 8 EIS was initiated in 2001. Public input has been gathered through focus groups, vision workshops, transportation surveys, public information meetings, meetings with property owners, and meetings with local committees. Through this process, the public has indicated that the problems affecting US 8 have grown to the point where the public supports and desires improvements to the US 8 corridor. They support improvements that address congestion and safety and improve travel to meet local business, industrial, agricultural, commercial, and residential needs.

In summary, answering the following questions for an alternative will indicate whether it satisfies the purpose and need of this project:

1. Does the alternative address the Corridors 2020 Plan by providing enough capacity to accommodate 2030 design year traffic and meet the future LOS?
2. Does the alternative address long-term planning and corridor preservation?
3. Does the alternative reduce the crash rate for the US 8 segment?
4. Does the alternative correct substandard roadway items and provide appropriate access management?
5. Does the alternative have public support from:
   - Local government
   - Area residents and businesses
   - US 8 Coalition

2.1.4 Alternative Development Process Summary

Table 2.1.4-1 provides an overview of the alternative development process from the conceptual stages through detailed study and the WisDOT-recommended alternative. A preferred alternative will not be selected until after agency and public comment on the DEIS is received.

Table 2.1.4-1

Alternative Development Process.

Concept	Initial Alternatives Considered		Alternatives Retained for Detailed Study	WisDOT-Recommended Alternative	Preferred Alternative
No-build	No-build		*		
TDM					
Add Passing Lanes					
Four-lane Alternatives by Segment	Four-lane Alternatives by Segment				
	I	Deer Lake On-alignment	Deer Lake On-alignment		
		Deer Lake Southern Realignment	Deer Lake Southern Realignment		
		(requested by VE Study and DATCP): Deer Lake Far Southern Realignment	Deer Lake Far Southern Realignment	DL Far Southern Realignment	
	II	Apple River/Clover Lake On-alignment	Apple River/Clover Lake On-alignment	On-alignment	
	III	Range On-alignment	Range On-alignment		
		Range Northern Realignment	Range Northern Realignment		
		Range Southern Realignment	Range Southern Realignment	Range Southern Realignment	
	IV	Joel Flowage On-alignment	Joel Flowage On-alignment	JF On-alignment	
		Joel Flowage Northern Realignment (requested by WDNR)	Joel Flowage Northern Realignment		
	V	Turtle Lake Alt 1 Short South Bypass	Turtle Lake Alt 1 Short South Bypass		
		Turtle Lake Alt 2 Long South Bypass	Turtle Lake Alt 2 Long South Bypass		
		Turtle Lake Alt 3 Northern Bypass	Turtle Lake Alt 3 Northern Bypass		
		Turtle Lake Alt 4 Through-town	Turtle Lake Alt 4 Through-town	TL Throughtown	
		US 63 South Connection			
		Turtle Lake US 63 North Bypass			
	VI	Poskin On-alignment	Poskin On-alignment		
		Poskin Realignment	Poskin Realignment	Poskin Realignment	
	VII	Barron Alt A Short South Bypass	Barron Alt A (mod.) Short South Bypass	Barron Alt A (mod.) Short South Bypass	
		Barron Alt B Long South Bypass	Barron Alt B Long South Bypass		
		Barron Alt C North Bypass	Barron Alt C North Bypass		
		Barron Alt D Through-town	Barron Alt D Through-town		

* While the No-build Alternative does not meet the purpose and need for this project, it does serve as a baseline for a comparison of impacts related to the Preferred Alternative.